



## Study of Biodiversity of Terrestrial Snail in Selected Locality of Amravati City, Central India

### KEYWORDS

Diversity, Terrestrial snail, Gastropoda, Cepaeaneomorlis. Amravati, Central India.

### Chavhan AB

Department of Zoology, D.B. College, Bhokar, Nanded, 431801, India.

### PawarSS

Department of Biology, Govt. Vidharbha Institute of Forensic Science Nagpur-01, India.

### JadhaoRG

Department of Zoology, Shivaji Science College, Morshi Road, Amravati-444603.

### ABSTRACT

*The Amravati is harbor in invertebrate fauna; the area is rich in terrestrial snail diversity. We select the three localities in Amravati area namely Navasari, Shivaji Nagar and Pote Town Ship for the present study. Our finding straightens the case more diversity to this area than other places. 11 species of terrestrial snail where identified in the survey area of these 10 are native species. In addition one species is rare i.e. Cepaeaneomorlis found only in Botanical Garden of Shri Shivaji Science College. Statistical data shows the significant diversity (2.32) for the Shivaji Nagar area and the Similarity index shows more significant value between the localities. i.e. Pote Township and Shivaji Nagar (4.18)*

### INTRODUCTION

Snails belong to a larger group of shelled animals called mollusks. Together, freshwater, saltwater, and terrestrial snails number well over 50,000 individual species, by far the largest group of mollusks. Molluscs constitute the second largest invertebrate and most successful group next only to insects (Abbot, 1989, Bouchet, 1991). It has been here for over 500 million years. The estimate of number of species of molluscs today varies from 80,000 species to 135,000, (Boss, 1973). Of these 31,000 – 100,000 are marine, 14,000 – 35,000 terrestrial and about 5,000 freshwater species (Abbott, 1989; Seddon 2000).

The Amravati is harbor in invertebrate fauna; the area is rich in terrestrial snail diversity. Amravati is a city in the state of [Maharashtra, India](#) and it is the seventh most populated metropolitan city in [Maharashtra](#). Amravati is located at 20°56'N 77°45'E / 20.93°N 77.75°E / 20.93; 77.75. It has an average elevation of 343 meters (1125 feet). It lies 156 km (97 miles) west of [Nagpur](#), and serves as the administrative center of [Amravati District](#) and of [Amravati Revenue Division](#). Amravati has a [tropical wet and dry climate](#) with hot and dry summers from March to June (Chavhan and Pawar, 2011).

Snails are soft-bodied animals that carry with them a protective shell. This shell is composed primarily of calcium and other minerals the snail has eaten and hardened into a well-formed shell. The soft-bodied animal is permanently connected to the shell by a strong ligament and other soft tissues. The snail's shell is used for protection from environmental threats and predators. Most species of freshwater snails originally evolved from saltwater habitats, although several species evolved from terrestrial habitats to freshwater. Snails usually play a dominant role in the ecology of freshwaters by providing food for many other animals and by grazing on vast amounts of algae and detritus (debris). They are critical to normal ecological processes in rivers. Their unusual common names such as: banded mystery snail, applesnail, pagoda slitsnail, knob mudailia, rough horn snail, interrupted rock snail, among many others often

believe their importance as a food source to other aquatic animals and as indicators of water quality.

In spite of great diversity, the land molluscs did not receive much attention till recently. The tropical rain forests are known for their rich land snail diversity and majority of them are found in the leaf litters and in the soil (Emberton, 1996) and their biomass is of great ecological significance.

### MATERIALS AND METHODS

#### Study Site

We selected three region i.e. Navasari, Pote town ship and Shivaji Nagar area for the sampling of Snail. Each of the three sampling sites where laid with five transects at four depths (one, two, five, and ten meters). The quadrats were delineated by rope squares whose corners were weighted with sandbags. Quadrats were situated so that surface area was relatively constant; when possible.

We collected all the snails within each quadrat. It is important to note that many small species of snails were probably not faithfully surveyed, and thus, although I have included them in my data sheets, they were not considered in the analysis of the community data. Also, because of the nature of the substrate in some of the quadrats, it is not unlikely that even some individuals of the larger species were left behind. We later identified each snail to species, counting the number of individuals of each species at each depth.

#### Species identification:

We identified snail species by observing their photograph and by land snail identification guide by (Timothy) (Kerney, 1979)

#### Data analyses

Snail species listed and the complete count of the number of species presented in each habitat were done for species composition and species structure indices. The results were used to indicate the species diversity. Shannon-wiener function (Krebs, 1999) was also used to calculate the

species diversity indices of the ants living in each type of habitats as follow:

$$H = \sum_{i=1}^S (pi) (\ln pi)$$

Where  $H$  = species diversity index

S=no. of species

Pi= proportion of the total sample belonging to  $i^{th}$  species.

To measure the similarity between two community samples, coefficient of Sorensen [13] was used as the following equation.

$$QC = \frac{2a}{2a + b + c}$$

Where QC = Sorensen similarity coefficient

a = no. of species in sample A and sample B (joint occurrences)

b = no. of species in sample B but not in sample A

c = no. of species in sample A but not in sample B

**RESULTS AND DISCUSSION**

We recorded total of 11 species of snails in study area. Of these 11 species significant number of count i.e. (10) ten with a record of were found in Shivaji Nagar Region, mostly in the campus of Shree Shivaji Science College, with record of a beautiful species *Cepia nemoralis*. While Navasari and Pote Town Ship region were recorded with (7) seven species of snail each. Table 1 shows the distribution of the snail species in the three regions.

The study of species diversity indices compared among the three region habitats Navasari (1.56), Pote town ship (2.29) and Shivaji Nagar (2.32) indicates that the difference in habitat influence the kinds of ant species inhibiting in these habitats. The similarity indices, tools for comparing the similarity between two community samples, vary from 40% to 60% among those habitats sites. By the similarity measurement, Shivaji Nagar- Pote Township and Shivaji Nagar- Navasari habitats showed the most similar snail species diversity. The highest similarity index between them indicated the highest number of snail species coexistence in both sites. It is possible that the places of human habitations may consist of some similar microhabitat types occurring in forest.

**Table 1** Showing distribution and diversity of terrestrial Snail in Three locality of Amravati City

Sr. No	Name of Species	Habitats		
		Navasari	Pote Town Ship	Shivaji Nagar
1	<i>Achatina fulica</i>	+	+	+
2	<i>Achatina immaculate</i>	+	+	-
3	<i>Achatina iredalei</i>	+	-	+
4	<i>Achatina nykaensis</i>	-	-	+
5	<i>Achatina reticulate</i>	-	+	+
6	<i>Achatina varicose</i>	+	+	+
7	<i>Achatina zanzibarica</i>	+	+	+
8	<i>Achatina knomil</i>	-	-	+
9	<i>Achatina marginata</i>	+	+	+
10	<i>Achatina ventricosa</i>	+	+	+
11	<i>Cepia nemoralis</i>	-	-	+
Total number of species		7	7	10

**Table 2:** Ecological indices of snail species structure in the three habitats: Navasari (N), Pote Town ship (P) and Shivaji Nagar (S) in the study area, Amravati.

Ecological Indices of Species Structure	N	P	S
Species Diversity Index (Shannon)	1.561	2.299	2.327
Similarity Index between N and P = 3.63			
Similarity Index between P and S = 4.18			
Similarity Index between N and S = 4.18			

The various ecological factors that must be taken into account in a cogent interpretation of any study of gastropod diversity and community structure in this region are indeed rather daunting. Care should be taken not to allow instances of point endemism, The possible metapopulation structures of the members of gastropod communities, with the resulting high degree of spatial and temporal variability among snail populations, can only be resolved through long-term monitoring over large areas. The founding and extinction of local populations can be truly understood in the context of sediment pollution only when we have an idea of natural turnover rates.

A study of microhabitat preference among members of the gastropod communities of Amravati provides valuable baseline data for further studies of gastropod diversity and community structure. Phenotypic variation within species between sites should also be looked into.

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